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Patrick L. Alston

The Dynamics of Educational Expansion in Russia

Between 1850 and 1940, amidst wars, revolutions, expanding and contracting frontiers, Russians and Soviets pondered the appropriate size of their student population. From the beginning political leaders related volume to academic type and social composition. In 1850 Tsar Nicholas imposed severe restrictions on enrollments at the six state universities while exempting some dozen specialized institutes. In the 1930s Comrade Stalin came close to dissolving the universities into institutes. In the 1880s and 1920s admissions were manipulated to favor social groups dear to the political leadership. In each century the political leaders also consistently subordinated enrollment dynamics to state security. Meanwhile, from generation to generation, the attending young people, long rebellious, now complaisant, exhibited a willingness to pursue any field of study in the allowed numbers as long as it did not include Latin or Greek.

Following the European pattern in general, and the Prusso-German model in particular, Russia's higher, post-secondary population consisted of men, increasingly after 1900 of women, usually graduates at the age of 18 or 19 of specified upper secondary schools, pursuing four- to five-year programs in such fields as law, medicine, or engineering at universities or institutes. Data on this population is incomplete. Since there was no single agency responsible for technical higher schools, as the Ministry of Education was responsible for the universities, there is a dearth of coherent information on institute volume especially before 1900; after 1918 the universities had their fields of study reported as components of the specialized higher educational mass. This study recognizes the severe statistical discontinuities occasioned by census enumerators and therefore proceeds in three parts.

Reform Expansion 1860–1900:

In 1859, after defeat in the Crimean war had shaken Tsardom to its felt boots, enrollment at the six state universities was allowed to rise to a record high of over 5,000, some 500 above the previous high of 1848 (up from 2,000 in 1836), and considerably above the anti-revolutionary low of 3,000 imposed in 1850. Closed in 1861 following student disturbances associated with the emancipation of the serfs, the universities received a new charter in 1864 granting considerable self-rule. Their re-opening in

1865 introduced the period of reform expansion that was to last until student riots in 1899 heralded the revolutionary age.[1]

Russia entered the Reform period with some 12 major institutes, concentrated in Moscow and St. Petersburg, specializing in such fields as mining, medicine, forestry, engineering, and law. Between 1860 and 1900 at least 12 more major institutes were opened (considerably more than the three new universities), again mostly in the two capitals, adding electrotechnics in St. Petersburg and oriental language training at the Vladivostok end of the newly opened Trans-Siberian railroad. The school census of 1880 counted more than 6,100 students in specialized higher schools, not including 1,010 in four clerical and three military academies. The total of 7,120 approached the 1880 university enrollment of 8,045. Among the major institutes, the Military Medical Academy enrolled 1,300. Only the capital universities were larger. Riga Polytechnical with 675 rivaled Kharkov and Kazan universities in size.[2]

By the late 1880s under Sergius Witte, Russia took the plunge into rapid industrialization. By the 1890s economic growth began to shift emphasis away from university to institute expansion. The graduates of the classical gymnasia designed to supply the universities were the prime suppliers of institute admissions. Of the 225 students entering the Kharkov veterinary institute in 1890, one came from an agricultural school, 28 were graduates of realschulen, and 195 holders of the Maturity from gymnasia.[3] Popular institutes were turning away applicants. In 1894 seven of the most prominent admitted 608 from 2,647 applicants.[4]

Nevertheless, the nineteenth century belonged to the expansion of government and university enrollment. In the early 1800s the university system had been created to supply the state with a management class trained in European science. Legislation in 1809 made university-level examinations mandatory for promotion in the civil service table of ranks created by Peter the Great in the 1720s. The decree of 1834 ranked state officials according to the three standard European educational levels. The legal connection between lower, secondary, and higher cognitive training and bureaucratic levels remained in force until 1917. In the 19th century the political leadership emphasized university expansion as a principal means for rationalizing the growth of government. In the 20th, it would promote institute expansion as a principal means for rationalizing the growth of the economy.

The 19th century registered an extraordinary growth in the state apparatus. At the end of the 18th century (1796), for a population estimated at 36 million, the number of government officials stood at 15 to 16,000: one bureaucrat for every 2,250 subjects. The 1851 census registered a population of 69 million with an official corps of 74,330: one agent for every 929 subjects. In 1903 the official corps had grown to an

1. Patrick L. Alston, *Education and the State in Tsarist Russia* (Stanford, 1969), 45.
2. V. R. Leikina-Svirskaia, *Intelligentsiia v Rossii vo vtoroi polovine XIX veka* (Moscow. 1971), 55.
3. Alston, 275, fn. 25.
4. Leikina-Svirskaia, 113. In 1900 the Ministry of Education imposed norms on the institutions of higher learning, both technical schools and universities, limiting the rise in new registrations to a 10 percent increment over the previous year. The regulations were not strictly enforced. Alston, 278, fn. 36.

army of 385,000 while the population (1897) had reached 129,000,000: one official to every 335 of the Tsar's subjects.[5]

The expansion of local government was a second specific force which contributed to the increase of university population after the Crimean War. With the landlord system of local government abolished by the emancipation of the serfs, new forms of district government had to be devised, the zemstvos. After 1864 the zemstvos competed with the state bureaucracy (expanding in part to supervise the zemstvos) for the doctors, lawyers, teachers, and scientists graduating from the expanding universities.

Two sets of figures are available for penetrating university dynamics (Table 1).[6] From 1865 to 1899 university enrollment increased 3.6 times (L). From 1865 to 1900 (without Warsaw) it increased 3.5 times (J). During the 35-year Reform period it increased at an average annual rate of 7.2 percent. From 1865 to 1885 the university population grew within the organizational framework of the statute of 1864 which granted local control to the faculties. In 1884 a revised statute insured central control.

The 1875–1885 decade of growth came after a stuttering start which impeded expansion for five years as the regime experimented with social and academic levers for controlling admissions. In 1872 the Ministry of Education made state final examinations for gymnasium graduates a prerequisite for university admissions. University registration dropped from 7,251 in 1872 to 5,692 in 1874. One motive behind tighter state control was to reduce dropouts, which did decline from a high of 1,069 in 1871 to 778 in 1877. The upgrading of the gymnasium with an eighth year in 1872 slowed university growth temporarily. Initially seminarians were exempt from state admissions examinations. They flooded first-year classes, especially in Odessa where they constituted 52 percent of admissions in the mid-1870s, bringing their "moral shortcomings and low academic achievements" with them, until their privileges were abolished in 1879.[7]

The political leaders in charge of state schools fully realized that the key to controlling the type and volume of higher expansion lay with secondary design. In the 1860s, Count Dmitry Tolstoy, Tsardom's most hated and effective Minister of Education, created a number of realschulen on the Prusso-German model to deflect secondary enrollment from the universities and toward higher technical institutes or directly into the skilled labor force. Despite official and public resistance, the Tolstoy realschule (the unacknowledged forerunner of the contemporary Soviet 10-year secondary school) expanded from 56 with 10,900 students in 1876 to 115 with 39,800 in 1900. In 1860 the gymnasia numbered 84 with 17,00 pupils. In 1899 they numbered 196 with 70,800. Under Tolstoy's firm leadership both the gymnasia and the connection between them and the universities were made more efficient. The means used were primarily academic, but the language was socially insulting. Despite public outrage, Tolstoy's policies reduced the number of academically weak pupils admitted

5. P. A. Zaionchkovskii, *Pravitel'stvennyi apparat samoderzhavnoi Rossii v XIXv* (Moscow, 1978), 221.
6. The L figures are from Leikina-Svirskaia, the J figures from William H. E. Johnson, *Russia's Educational Heritage* (New York, 1969, 2nd ed.).
7. Allen Sinel, *The Classroom and the Chancellery: State Educational Reform in Russia under Count Dmitri Tolstoi* (Cambridge, Mass., 1973), 99–100.

Table 1: Total University Enrollment, 1865–1900

	1865		1875		1880	1881	1885		1894	1895	1899	1900
	L	J	L	J	L	J	L	J	J	L	L	J
With Warsaw			5,569		8,045		12,804			14,109	16,294	
Without Warsaw	4,125	4,641	5,032	5,151	7,397	9,344	11,551	11,544	13,169	13,217	15,180	16,357

Table 2: Individual University Enrollments, 1865–1900

		1865		1875		1880	1881	1885		1894	1895	1899	1900
		L	J	L	J	L	J	L	J	J	L	L	J
	Organized												
Moscow	1755	1,519	1,741	1,168	1,201	1,890	2,504	2,874	3,179	3,761	3,906	4,407	4,562
Petersburg	1819	524	785	1,123	1,223	1,677	2,155	2,282	2,340	2,675	2,768	3,758	3,613
Kiev	1835	497	555	666	772	1,041	1,337	1,821	1,589	2,453	2,313	2,606	2,602
Kharkov	1804	524	588	407	430	637	937	1,372	1,372	1,090	1,275	1,387	1,506
Kazan	1804	289	413	463	512	791	825	925	969	816	751	818	906
Dorpat	1802	594	560	832	735	1,105	1,164	1,704	1,485	1,496	1,301	1,733	1,647
Odessa	1865	178		273	281	346	422	573	610	506	506	714	954
Warsaw	1869			537		648		1,253			892	1,114	
Tomsk	1888									377	397	447	557

and actually raised the number of graduates, the academic bottom line. In the major eight of the 15 school districts into which the empire was divided (the eight contained over 90 percent of total pupils) total graduations climbed from 2,014 in 1885 to 2,679 in 1890 as total enrollment dropped from 53,027 in 1885 to 43,519 in 1890. In the same eight districts the ratio of gymnasium graduates to total enrollment stood at 26.3 to 1 in 1885 and 16.2 to 1 in 1890.[8] Between 1865 and 1900 the gymnasium population increased 2.6 times, the university population 3.5 times. As fewer pupils dropped out and more graduates went on to the higher level for which they had been expensively trained, the proportion of total gymnasial to total university enrollment dropped from 8 to 1 in 1865 to 5 to 1 in 1900. This was superior management in any century.

Nine universities contributed their individual dynamics to aggregate performance. Institutional patterns broadly registered the force of site and tradition in a school's attraction for students (Table 2). Through the Reform period, Moscow remained the principal institutional component of macro dynamics. Its share of total enrollment stood at 37% in 1865, or at 27% in 1900. Between 1865 and 1875 Moscow was the major drag on overall expansion. St. Petersburg was the most expansive tributary of aggregate growth. During the Reform period its share of the total increased from 12% in 1865 to 22% in 1900 without benefit of a medical school. The growth of the two capitals accounted for close to 50% of the aggregate in 1865 and 1900.

Kiev and Kharkov constituted Ukrainian growth, accounting for 24% of the aggregate in 1865 and 1900. Kiev was the more dynamic. In 1900 its share of total registration reached 15%. Dorpat and Warsaw represented western frontier growth, Dorpat the old German school, Warsaw the new Polish. Both adhered to the macro pattern of reform expansion.

Kazan, Odessa, and Tomsk were the smaller schools. Kazan represented old growth on the upper Volga and Odessa new institutional growth on the Black Sea. In 1876 the Governor-General of Siberia warned that unless his region acquired a university, it would never have "a sufficient number of experienced, trained and conscientious personnel" necessary to "make its natural resources productive". Lack of finances after the Russo-Turkish War forced delay. Finally, in 1888, after generous local funding, Siberia got its first university at Tomsk.[9] Odessa was the most expansive of the small three. By 1900 it had caught up with Kazan with a 5% share of enrollment. The decline of their smaller populations in 1885–1895 contrasted with the simultaneous increases of the largest three.

Institutional patterns fed macro dynamics from nine streams. Students enrolled in one of four fields: Liberal Arts (historical-philological faculty), Natural Science (physics-mathematics), Medicine, and Law. Field dynamism was partly an expression of student choice nurtured by family background, personal tastes, the changing social prestige of the professions, the fame of individual professors, and above all, if we are to believe the memoirs of the time, the young man's judgment on how best he might serve the "dark" peasant masses, who had illiterate ideas of their own beyond the grasp of those determined to rescue them from history with science (Table 3).

8. The figures are in Alston, Appendix A.
9. Sinel, 89–90.

Table 3: University Enrollment by Fields, 1865–1899

	1865	1870	1875	1880	1885	1890	1895	1899
Liberal Arts	260	474	496	897	1,194	729	697	685
Natural Science	962	1,055	904	1,714	2,465	2,438	2,826	3,837
Law	1,953	3,047	1,867	1,831	3,670	4,071	5,103	7,182
Medicine	839	1,375	2,114	3,499	4,704	4,860	5,171	4,999

Law dominated the field dynamics of Reform expansion. In 1865 its share of the four fields was 48%; it was 42% by 1899. While total population was expanding 50% between 1875 and 1880, the legal field was declining two percent. Between 1880 and 1885 total enrollment expansion was powered by a delayed boom in Law.

Medicine was the most expansive of the four fields, its share of students increasing from 20% in 1865 to 39% in 1875. In 1895 Medicine and Law converged, each with 37% of the whole. During the decade of slow expansion, 1865–1875, while aggregate population was increasing 10%, Medicine mushroomed 151%, mitigating the macro slump of 1870–1875.

Natural Science exhibited the steadiest, least volatile, field performance, quadrupling its enrollment volume in 1865–1899. Its 23% share of the gross in 1865 was still at the same level 34 years later in 1899. In contrast Liberal Arts followed a rising and falling line. Its 6% share of the population in 1865 shrank to 4% in 1899.[10]

During the Reform period, poverty, that universal stimulant/depressive, was a major force in university expansion. An average of 2,000 students a year enjoyed tuition exemptions while some 40 to 60 percent received some form of financial assistance in the 1860s and 1870s.[11] The universities provided a social elevator for those without wealth and the family connections described by Tolstoy in his great novels of gentry life. The wealthy attended military schools like Anna Karenina's Vronsky. The poor, like Anton Chekhov, studied medicine. State fellowships which were tied to service in secondary education could not attract them in large numbers to the shrinking Liberal Arts.

The census of 1897 calculated that 97,600 men and 6,300 women had studied at a university or equivalent higher school, not necessarily to completion. In addition, 29,600 men and 619 women had studied for an indeterminate time at a technical in-

10. Field figures are from Leikina-Svirskaia. The examination of field performance at individual institutions reveals patterns unseen at the aggregate levels. For instance: Law enrollments were most expansive at St. Petersburg, least expansive at Moscow. While St. Petersburg was multiplying Science 5 times between 1865 and 1899, Moscow was multiplying it 3.25. The trend in the Medical field during Reform expansion was toward a more even dispersion of medical students among the various schools. At the same time Liberal Arts showed a movement toward concentration of students in St. Petersburg and Moscow.
11. Sinel, 101.

stitute. Of this number at least 58,000 were full-fledged university graduates and another 7,783 graduates of institutes with university fields. Nine major institutes had produced 13,086 graduate engineers and technicians while 3,800 had graduated from forestry and agronomy schools.[12]

Despite the increase in trained talent, the educational level of key government agencies remained dangerously low. The landed gentry still clogged career streams with social privileges sometimes annulling academic prerequisites. Legal gentry favoritism in the civil service was not abolished until 1905. Especially low at the end of the 19th century was the cognitive level of officials in the Ministry of Internal Affairs, responsible for the police and internal security. Of 1,609 persons entering service 1894/95, 17% had some higher education, 10% some secondary, and of the 72% with lower education, one-fourth had not completed the three-year elementary district school.[13]

With staffs of comparable training for controlling the passions of 125,000,000 Slavs, Turks, Lithuanians, Finns, and Georgians, the old leadership faced two wars and two revolutions in the first 17 years of the 20th century. Out of the struggle would emerge a new leadership with a revised attitude toward science, higher education, and its expansion.

Revolutionary Expansion 1900–1928:

Between 1900 and 1928 the Russian Empire boiled away in three revolutions and three wars, resulting in a population deficit of nearly 28 million or 16 percent of the expected population (1926 census).[14] The reduced territory with its exhausted population was reorganized as the Soviet Union. The period closed with the universities on the brink of dissolution. It opened with an unprecedented upsurge, a doubling of enrollments in less than a decade (Table 4).[15]

During the Revolution of 1905 Witte's Minister of Education rescinded the ban on seminarians, allowed realschule graduates and commercial high school graduates to enter the university on passing a Latin examination, and revoked an order forcing secondary school graduates to attend the university closest to home. As the mobs took over the streets, faculty ignored the statute of 1884 and admitted Jews and women as regular students or as auditors. Jewish enrollment increased from 2,247 in 1904 to 4,266 in 1906–1907. By 1907–1908, 10,364 students squeezed into St. Petersburg which had registered 4,652 in 1904. The number of lower class students in the capital rose from 14.4% to one-third between 1904 and 1908.[16]

Between 1908 and 1911 political unrest rocked the universities; mass expulsions of students and mass resignations of faculty paralyzed the pursuit of pure European science at Moscow University. In 1912 Nicholas II emulated Nicholas I in an in-

12. Figures extracted and totaled from Leikina-Svirskaia, 69–70.
13. Zaionchkovskii, 34.
14. Frank Lorimer, *The Population of the Soviet Union: History and Prospects* (Geneva, 1946), 39.
15. Johnson, 287.
16. Samuel Kassow, "The Russian University in Crisis, 1907–1911: The Evidence from the Archives," *Slavic and European Education Review*, 1 (1978), 2.

Table 4: University Enrollments, 1900–1912

	1900	1904	1906	1909	1911	1912
Petersburg	3,613	4,652	7,442	8,663	8,227	7,282
Moscow	4,562	5,810	8,419	10,086	9,242	9,390
Kiev	2,602	3,099	4,179	4,857	4,098	4,857
Kazan	906	1,308	2,821	3,049	3,487	2,955
Kharkov	1,506	1,792	3,216	4,936	5,274	3,315
Dorpat	1,647	1,872	1,902	2,415	2,749	2,251
Odessa	954	2,162	2,456	3,232	3,193	2,756
Tomsk	557	811	998	1,110	1,347	412
Saratov				92	289	412
Totals	16,347	21,506	31,433	38,440	37,906	34,110

struction to the Council of Ministers on expansion: "I think Russia needs higher technical institutions and *even more so* intermediate technical and agricultural schools, but the already existing universities are sufficient. Take this resolution to be my guiding order."[17] The Tsar's decree would be echoed by Stalin, Khrushchev, and Brezhnev.

As the government recovered from the Revolution of 1905 it reduced university enrollments from the all-time Tsarist high in 1909. Only Tsardom's last full year, 1916, registered a slight increase to 35,695 despite World War I. In the midst of war and revolution two new universities were opened, at Perm in 1916 and Rostov in 1917.

By 1912 the distribution of fields had shifted slightly from 1899. Law maintained its dominant 40% with 14,477. With 3,106, Liberal Arts increased its share of total university enrollment from four to nine percent. Medicine with 9,238 and Natural Science with 9,036 divided the remaining 50 percent.[18] The marked increase in Liberal Arts remains to be clarified.

After the Revolution of 1905 Higher Courses which provided women with the equivalent of a university education exploded, from 5,174 students in 1905 to 28,274 in 1912. By 1914 some 85 institutes enrolled an estimated 62,000 students. Figures are available for some 30 institutes for the years 1899 to 1912 (Table 4).[19]

17. Kassow, 16.
18. James McClelland brought this data to my attention in D. I. Bagalei, "Ekonomicheskoe polozhenie russkikh universitetov," *Vestnik Evropy* (Jan., 1914), 58–59.
19. For Higher Women's Courses see Nicholas Hans, *History of Russian Educational Policy 1701–1917* (London, 1931, reissued 1964), 241. Institute figures are from Johnson, 288–289.

Table 5: Institute Enrollments, 1899-1912

Male Enrollment in Russian Institutions of Higher Learning, except Universities [excluding Poland and Finland]

NAME AND LOCATION OF INSTITUTION	Organized	NUMBER OF STUDENTS			
		1899	1902	1907	1912
Institute of Mining (SP)	1773	480	550	664	640
Military-Medical Academy (SP)	1799	768	750	750	900
Forestry Institute (SP)	1803	501	516	565	560
Bezborodko Lyceum (Nezhin)	1805	87	81	98	131
Institute of Ways of Communications (SP)	1810	886	894	900	1,384
Commercial Academy (M)	1810	403	?	?	4,261
Alexander's Lyceum (SP)	1811	106	?	?	290
Lazarev Institute (M)	1815	36	59	130	141
Technological Institute (SP)	1828	1,016	1,109	1,610	2,525
Higher Technical School (M)	1830	865	1,989	2,000	3,000
School of Law (SP)	1835	112	330	330	350
Institute of Civil Engineers (SP)	1842	353	530	510	810
Riga Polytechnic Institute	1862	1,446	1,701	1,750	2,088
Petrovskii Agricultural Academy (M)	1865	198	225	500	1,000
Historico-Philological Institute (SP)	1867	94	88	107	134
Demidov Lyceum (Yaroslavl)	1868	281	456	665	669
Nicholas' Lyceum (M)	1869	24	?	201	277
Archeological Institute (SP)	1879	195	?	?	542
Kharkov Technological Institute	1885	812	1,000	1,200	1,400
Electrotechnical Institute (SP)	1886	143	300	362	750
School of Engineering (M)	1896	236	380	567	580
Kiev Polytechnic Institute	1898	598	846	1,370	2,500
Ekaterinoslav Mining Institute	1899	--	128	250	480
Vladivostok Oriental Lang. Inst.	1899	--	76	125	127
Tomsk Technological Institute	1900	--	100	812	1,171
Polytechnic Institute Sosnovka (SP)	1902	--	--	700	5,215
Psycho-Neurological Institute (SP)	1907	--	--	--	2,590
Novocherkassk Polytechnic Institute	1907	--	--	--	704
Shaniavskii University (M)	1908	--	--	--	3,669
Oriental Academy (SP)	1909	--	--	--	102

In 1914 an estimated 127,000 students were enrolled in 105 higher schools: some 35,000 men in universities, about 34,000 women in Higher Courses, and 58,000, mostly men, in specialized institutes. The increase in the number and enrollment of institutes indicated a positive response on the part of public and government to Witte's admonition (made from exile in the Concil of State) that Russia must have schools of European quality not only on traditional political grounds but on economic grounds alone, given the world commercial competition of 1912.[20]

Between 1905 and 1915, an estimated 22,000 boys and girls were graduating annually with the maturity certificate permitting access to higher education. Some 10% of them were unable to gain admittance because of crowded conditions. While the number of secondary schools had doubled, only one new university had been opened. In May 1916 the Minister of Education recommended opening 10 new universities in various parts of Russia.[21] His recommendation would be carried out by men returning from Switzerland and Siberia.

The revolution introduced further uncertainty into enrollments. By the end of 1917 most students had left the lecture halls for the streets. The number of those actually studying fell to a handful. After the new Soviet regime introduced open admissions without secondary prerequisites, tertiary enrollments soared to over 200,000 and then fell off, victims of famine, typhus, civil war and lack of adequate academic preparation. By 1924 the political leadership had struck an uneasy truce with the peasantry and some semblance of order was restored. Student populations stabilized and began to climb as limited economic recovery took hold (Table 6).[22]

Of the 152 higher schools in 1928, 19 were universities, ten of them founded after 1918 in Baku, Minsk, Voronezh, Gorkii, Dnepropetrovsk, Erevan, Irkutsk, Tashkent, Tbilisi, Sverdlovsk. The names are partly a roll-call of Soviet nationalities. Two of the old Tsarist national universities reverted to their independent countries, Warsaw to Poland, and Dorpat/Yurev to Tartu in Estonia.

In the mid-1920s some 50,000 boys and girls were graduating annually from the nine-year secondary school with maturity certificates. At the same time 22,000 were being admitted to the higher schools, only half of them with the maturity certificate. Thus some 10,000 or 20% of those with formal academic qualifications were going on to higher education. It would be a decade before the Soviet government would adjust the academic leverage regulating the flow of graduates from level 2 to level 3. During its first decade it subordinated academic concerns and expansion to its social program. In 1924–1935 some 18,000 students were purged, many for belonging to the wrong social class.[23] With the declaration of war on the peasantry, its collectiviza-

20. Alston, 281, fn. 7.
21. Paul N. Ignatiev and Others, *Russian Schools and Universities in the World War* (New Haven, 1929), 197.
22. Figures are in Seymour M. Rosen, *Education and Modernization in the USSR* (Reading, 1971), 196 and Alexander G. Korol, *Soviet Education for Science and Technology* (New York, 1957), 132.
23. Oskar Anweiler, *Geschichte der Schule und Pädagogik in Russland vom Ende des Zarenreiches bis zum Beginn der Stalin Ära* (Berlin, 1978 2nd ed.), 205, fn, 100; James McClelland, "Proletarianizing the Student Body: The Soviet Experience during the New Economic Policy," *Past and Present*, 80 (1978), 130.

Table 6: Combined University and Institute Enrollments, 1914–1928

Year	No. of Schools	Thousands of Students
1914	105	127.4
1922	248	216.7
1923	187	208.3
1924	169	169.5
1925	145	167.0
1926	148	168.0
1927	148	168.5
1928	152	176.6

tion, and the inauguration of the first Five-Year Plan for converting an unmanageable agrarian mammoth into an obedient industrial giant, Stalin's slogan "Cadres decide everything" decided the future of Russian science, higher education, and its expansion. All three were harnessed to the economic growth that alone could stave off defeat in the next war. A new era, plan expansion, began.

Plan Expansion 1928–1940:

Plan expansion inaugurated a convulsive increase in the number of schools, primarily achieved by breaking up existing universities and institutes into specialized fields. The five departments of the Higher Technical School founded in Moscow in the 1830s provided the nuclei for five Soviet engineering institutes. Subsequently some institutes were consolidated and the universities restored, at least in name. The number of higher schools shot up from 152 in 1929 to 579 in 1931, peaked at 832 in 1933 and dropped to 688 in 1935. Among this array of schools were two new universities at Samarkand and Alma Ata, inviting Uzbeks and Kazakhs into the cadre pool.

The year 1928 provides the base for measuring expansion. Announced in 1928 to start in 1929, Plan One was completed in four years. Plan Two ran for five years. World War II interrupted Plan Three (Table 7).[24]

24. Figures for Tables 7, 8, 9 from Nicholas De Witt, *Education and Professional Employment in the U.S.S.R.* (Washington, D.C., 1961).

Table 7: Total Higher Education Enrollment, 1928–1940
(In Thousands)

Plan 1					Plan 2					Plan 3		
1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
176.6	204.2	291	430	508.7	462.3	521.8	524.6	535.7	548.5	602.9	619.9	585

Table 8: Higher Education Enrollment by Fields, 1928–1940
(In Thousands)

	Plan 1				Plan 2					Plan 3			
	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Engineering	52.3	62.8	130.3	197.3	233.4	188.3	198.8	193.9	175.6	170.5	194.6	201.5	176.8
Agriculture	26.9	34.0	44.7	57.5	62.2	54.2	61.3	63.5	58.5	53.3	62.5	56.6	45.7
Administration	16.5	18.3	21.7	30.7	34.3	38.2	31.1	30.8	29.5	30.1	26.8	27.7	22.5
Education	45.5	49.9	47.8	76.4	93.5	88.5	113.1	120.0	138.5	149.4	196.7	221.1	230.2
Health	25.6	26.1	27.6	32.1	46.4	47.7	61.4	76.3	85.3	91.2	109.9	113.0	109.8

In 1939 plan expansion peaked at a growth multiple of 3.5 times its 1928 base for an average annual increase of 22.8% over 11 years. Expansion proceeded most rapidly during Plan One. In 1928–32 enrollment increased 2.8 times for an average annual growth of 47% over four years. During Plan Two enrollment grew only 7% from the base of 1932, for an average annual growth of less than 1.5 percent. Of the 585,000 students in some 700 schools in 1940, 75,682 (12%) were in 29 universities.

With plan expansion the distinction between technical institutes and universities has all but disappeared. The European name is retained for universities, but the training they give is as narrow as that of institutes with emphasis on specialists in research and teaching. After 1931 university activity is reported statistically under Education. The dynamics of expansion shift away from the universities, away from individual schools, away from the distinction between institutes and universities. They focus on the five practical fields of level-3 schooling: Engineering, Agriculture, Administration, Education, and Health.

Two years powered Plan One's Bolshevik tempo: 1930 increased 42% over 1929; 1931 increased 42% on top of that. The slump of 1933, registering a 10% decline, introduced Plan Two, which never achieved more than two percent growth in any of its five years. The five fields accounted for over 95% of total Soviet tertiary population during the decade of Socialist Construction. In 1928 other fields, such as Communist Party schools, accounted for 5.5% of the total; in 1938 only two percent. After 1938 higher learning expansion entered a phase complicated by the introduction of massive extension enrollment and the approach of World War II (Table 8).

Engineering powered the heroic expansion of Plan One. In two years Bolshevik tempo tripled its enrollment, increasing its share of level-3 population from the leading 29% in 1928 to the dominating 45.8% in 1932.

Engineering's decline after 1932 was a major erosion factor creating the statistical plateau characteristic of Plan Two. In 1937, at the end of Plan Two, there were 62,900 less Engineering students in the system than in 1932.

In 1928 Education comprised 25% of the gross. By 1938 its growth multiple of 4.3 times its 1928 base pushed it past Engineering and increased its share of total population to the same level as Engineering, 32 percent. Education started late. While Engineering expanded 107% in 1930, Education declined five percent. The next year it registered a 59% increase. In the slump of 1933 it declined 6%, compared with Engineering's 20% loss. Henceforth it registered substantial increases year after year. Education's strong and continued expansion during Plan Two was the major factor offsetting Engineering's erosion of the aggregate.

Health was the principal support of Education for the maintenance of net enrollment expansion throughout Plan Two. In 1928 Health accounted for 14% of the gross. By 1938 it had multiplied 4.25 times and increased its share to 18 percent. Health's quantum jump of 44% over the previous year occurred in 1932, one year after Education's leap.

Agriculture displayed less dynamism than Health. In 1928 its student pool was slightly higher than Health's for 15% of the aggregate. Ten years later, Agriculture had multiplied 2.3 times and reduced its share of the gross to 10 percent.

Administration held the smallest share of the five fields and exhibited the least growth. Between 1928 and 1938 it expanded 62%, its share of the gross declining from 9.3% in 1928 to 4.4% in 1938. But it outperformed all other fields during the ma-

Table 9: Admissions Relative to Enrollments: Total, Engineering and Education, 1928–1940
(In Thousands)

	Plan 1				Plan 2						Plan 3		
	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Total:													
Enrollment	176.6	204.2	291	430	508.7	462.3	521.8	524.6	535.7	548.5	602.9	619.9	585
Admissions	42.8	56.2	144.2	184.9	245.8	163.6	174.7	182.3	148.6	158.3	204.6	188.7	161.5
Engineering:													
Enrollment	52.3	62.8	130.3	197.3	233.4	188.3	198.8	193.9	175.6	170.5	194.6	201.5	176.8
Admissions	16.8	22.9	78.4	88.6	114.5	55.8	53.3	49.1	34.6	40.0	54.0	53.4	41.1
Education:													
Enrollment	45.5	49.9	47.8	76.4	93.5	88.5	113.1	120.0	138.5	149.4	196.7	221.1	230.2
Admissions	10.4	14.1	29.9	36.6	56.4	38.4	46.3	54.1	51.7	60.0	86.4	86.3	82.2

cro slump of 1933, registering an 11% increase and achieving its apex for the period of Socialist Construction.

Admissions were a major force in shaping enrollment dynamics (Table 9). 1930 was the year of the deluge in admissions, with an aggregate increment of 88,000. Engineering contributed 55,500 for 63% of the gross increase; Education, 15,800 for 17% of the whole. While Plan One admissions ran ahead of enrollment expansion, Plan Two admissions anticipated enrollment contraction. In 1933 the 44% slump in admissions triggered a 10% enrollment decrease. In 1936 a 19% decline in admissions slowed enrollment to a two percent rise. In 1933 82,200 fewer students were admitted to higher learning than in 1932. In the year of the macro slump, Engineering admissions fell off 18,000, 21% of the gross decline.

The ratio of admissions to enrollment is a major index to plan expansion dynamics. Admissions climbed from 24% of total enrollment in 1928 to 48% in 1932. At the start of Plan Two, admissions were 35% of total enrollment; they fell to 27% in 1936 before closing out the decade of Socialist Construction at 33% of enrollment in 1938. In 1935 Education admissions surpassed Engineering admissions for the first time. In 1938 the Education population overtook Engineering. Admissions and enrollments were roped together on the mountain, but they did not always climb in the same direction. In 1936, when macro admissions fell 19%, macro enrollments rose two percent. The most extreme case of admissions and enrollments disparity occurred in Education in 1930. That year Education admissions went up 122% over the previous year while Education enrollment went down 5%. Six years later in 1936, Education admissions were down five percent, enrollment up 15 percent. In 1940 the universities admitted 22,334 (26% of Education admissions), close to the number admitted to the universities in 1914 and 1925.

In contrast, graduations became a ripple effect at some years distance from admissions. From the data it is possible to construct the missing segments of reported population flow, students continuing from one year to the next (second, third, and fourth year), and students withdrawing prematurely from the system each year (Table 10). In 1932 admissions peaked at a multiple 5.7 times of 1928; in 1934 continuations achieved their apex at a level 2.8 times of 1928; in 1937 graduations reached maximum volume at 2.7 times of 1928. During this period withdrawals oscillated from unlikely zeroes to highs of 65% of admissions volume in 1932 and 86% of admissions volume in 1934. The continuation stream buffered the graduate pool from the fluctuations of admissions and withdrawals. Between 1928 and 1935 the proportion of next year's graduates in the continuing stream of a given year oscillated from a high of 48% in 1930 to a low of 15% in 1932. From 1936 on the percentage stabilized at 36% (1936) to 39% (1938). Fed by some 700 schools, the macro system was settling down to functioning as a 5-year program with the continuing stream containing roughly equal segments of the second, third, and fourth year classes.

From 1933 on it is possible to measure retention: graduate volume as a percentage of admissions' volume five years previously. In 1933 and 1934 graduate volume achieved an unlikely 80% and 87% retention rate of 1928 and 1929 admissions. From 1935 to 1940 graduates (admitted 1930–1935) registered a more plausible retention rate, fluctuating between the low of 42% of 1932 admissions graduating in 1937 to the 63% of 1933 admissions graduating in 1938. In 1939 the macro system produced almost as many dropouts (96,700) as graduates (98,300). Macro graduations jumped up

Table 10: Total Graduations Relative to Admissions, Continuations, and Withdrawals, 1928–1940
(In Thousands)

	Plan 1				Plan 2						Plan 3		
	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Admissions	42.8	56.2	144.2	184.9	245.8	163.6	174.7	182.3	148.6	158.3	204.6	188.7	161.5
Continuations	105.1	115.1	102.9	195	219.7	264.1	297.9	238.6	289.5	285.4	294.5	332.9	322.7
Graduations	28.7	32.5	43.9	50.4	43.2	34.6	49.2	83.7	97.6	104.8	103.8	98.3	102.2
Withdrawals		24.9		117	166.8	80.6	150.3	33.8	47.9	45.4	67.9	96.7	

in 1935 with a 70% increase. The principal tributary of 1935's graduate flow was Engineering, since its graduations peaked at 4.1 times of 1928. Already 67% of admissions in 1931, Engineering withdrawals rose to a 73% rate in 1932. In 1939 more of its students (37,400) dropped out than graduated (28,400).

In contrast, Education graduates increased, maintaining with the aid of Health the macro system's high graduate plateau of 1936–1940. 1936 was the year of the quantum jump in Education graduations, a 72% increase over 1935. In 1935 Education as a whole stabilized as a four-year cycle with the graduate share of the continuing stream (second and third years) rising from 40% in 1935 to 54% in 1938.[25]. In 1941 the universities graduated 7,963 (19% of Education). Internal growth supplemented external growth as Education retention rates rose. The percentage of admissions for 1930–1932, graduating between 1934 and 1936, increased from 26 to 38 percent. More than 80% of the students admitted 1933–1934 graduated in 1937–1938.

While retention rates went up, the annual withdrawal rate fluctuated widely between 1937 and 1939, presenting another puzzle within the dynamics of Soviet statistics. But this much appears clear from the data available to this study: the dynamics of plan expansion sprang from broad admissions and broad withdrawals that produced a net rise in the continuing stream. Continuations appear generally stable after the massive withdrawals that seem to come mostly out of the first-year admissions stream.

The explosive growth in tertiary admissions outran the capacities of the secondary system. In the mid-1930s only about 15% of entering students came from regular secondary schools. By the late 1930s the secondary system had recovered its role as the academic filter for further education. By then at least one and possibly two 10-year-school graduates were available for each vacancy in the higher schools.

Plan expansion had considerable impact on the percentage of 17- (or 18-) year-olds admitted to higher schools from the total cohort (Table 11).[26] To move from a 1.3% to a 4.1% maximum of the age cohort admitted within two years, the government actively recruited workers, women, and non-Russians with varying success. Between 1928 and 1932 the number of students from the working class increased from 25.4% to the plan high of 58 percent.[27] Worker's faculties at the higher schools provided remedial secondary schooling. The proportion of women students increased from 28% in 1927 to 43% in 1937.[28] Non-Russians contributed to the swelling student stream. While the bulk of the growth came from Russia and the Ukraine, the Georgians increased from 10,500 students in 1928 to 16,500 in 1934; the Uzbekistans (not all Uzbeks) increased from 3,900 students in 1928 to 10,900 students in 1934.[29] Until the mid-1930s social recruitment quotas (more for workers and women than for peasants and Turks) had priority over academic standards. From the mid-1930s on, academic standards re-

25. Tables on Engineering and Education withdrawals are in Patrick L. Alston, "The Dynamics of Educational Expansion: Russia," presented to the Conference on Education and Social Change at the University of Missouri-Columbia, March 7–8, 1980.
26. Author's calculations and De Witt, 262.
27. Anweiler, 362.
28. Gail Warshofsky Lapidus, *Women in Soviet Society* (Berkeley, 1978), 149.
29. Jaan Pennar and Others, *Modernization and Diversity in Soviet Education* (New York, 1971), 350.

Table 11: Admissions and Age Cohort

Year	17-(or 18)	First Year Admissions	Maximum Percent
1914	3,326,940	20,000	.60
1925	3,308,000	22,000	.66
1928	3,400,000	43,000	1.3
1930	3,500,000	144,000	4.1
1940	3,200,000	155,000	4.7

turned to the place they had assumed in the 1870s. It took the Russian state 60 years to work its way through the social and political turbulence interfering with the extension of higher education to larger proportions of the total population (Table 12).[30]

Around 1930, while the nations they had once modeled their education upon sank into an economic depression overcome only by war, the Soviets achieved full employment. Henceforth tertiary admissions were in competition with the labor market for the annual crop of 15- and 17-year-olds. In 1940 France fell. Military manpower took precedence over school and factory. By 1942 student deferments were restored. In 1958 the manpower and fertility losses of the war (the census of 1958 calculated a birth deficit of 12 million) pitted higher education and the labor market head-on in the Khrushchev reforms. In the 1970s the Soviets achieved universal secondary education, and the political leadership has set higher admissions at 20% of secondary graduates.[31] Its judgment is answerable at the moment only to the next war.

30. Author's estimates.
31. The basic study for the dynamics of expansion and the connection between level 2 and level 3 in the 1970s is Wolfgang Mitter and Leonid Novikov, *Sekundarabschlüsse mit Hochschulreife im internationalen Vergleich* (Weinheim, 1976).

Table 12: Student and Total Population

	1859	1880	1897	1914	1926	1939
	61,648,000	97,705,000	125,640,000	166,347,000	147,027,000	170,467,000
University	5,000	8,045	15,000	69,000	40,000	75,682
Institute	3,750	7,110	15,000	58,000	128,000	544,218
Total	8,750	15,155	30,000	127,000	168,000	619,900
Total Number of Students Per 10,000 Population	1.4	1.5	2.4	7.6	11.4	36.3
Age Cohort 20-24	5,548,320	8,793,450	11,307,600	14,970,600	13,813,400	14,370,954
Students Percentage of Age Cohort	0.14	0.17	0.2	0.8	1.2	4.3